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ABSTRACT

This paper argues that a domain-based approach can be used to explain the complex tonal structure of Xhosa nouns by means of a single H tone spread rule. The argument proposes an H tone-motivated domain structure for every noun type, referred to as Tone Domains (TDs), with the number of TDs determined by the number of lexical H tones in a given word. It is then demonstrated that the H tone in each TD spreads to its right edge provided the Obligatory Contour Principle (OCP) is not violated. The significance of this approach is that it explains why the prefixal H tone would spread to the penult in some words and to the antepenult in others. It also explains why the preprefixal H tone is subjected to the rule in some nouns but not in others. (MDM).

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ED 370 414

XHOSA NOMINAL TONOLOGY: A Domain-based Approach

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Abstract: In this paper I argue that a domain-based approach explains in a straight forward way, by means of a single H tone spread rule, the complex tonal structure of isiXhosa nouns. For every noun type I propose H tone-motivated domain structures, and I call them Tone Domains (TDs). The number of TDs is determined by the number of lexical H tones in a word. I then demonstrate that the H tone in each TD spreads to its right edge provided the Obligatory Contour Principle (OCP) is not violated. The significance of this approach is that it explains why the preprefixal H tone would spread to the penult in some words, but to the antepenult in others. Also, it explains why the preprefixal H tone is subjected to the rule in some nouns, but not others.

1. Introduction.

In this paper I propose and discuss a domain-based approach to Xhosa nominal tonology. I show that the domain-based approach to phonology, developed by Kisseberth (1992), is a successful theoretical device for the analysis of complex tonal systems such as Xhosa, a Bantu language spoken in South Africa. In particular, I argue that within this framework there is only one H tone spread rule in Xhosa nominals, and that this rule applies within a tone domain which is triggered by the presence of a H tone.

Kisseberth (1992) defines a domain as 'a sequence of phonological material enclosed by a left and right bracket'. He asserts that this approach assumes the existence of phonological rules, and that 'prior to the application of a rule to a representation, a domain structure should be assigned to the representation.'

I must from the onset state that although this approach entails the same central idea of 'prosodic domains' developed by Selkirk (1980a, b) and Nespor and Vogel (1986), it nonetheless represents a somewhat different view in that it does not rely on the hierarchy of prosodic levels. For example, my analysis will show that a word may have a sequence of unlayered tonal domains depending on the number of lexical H tones.

In general Kisseberth takes the position that the domain types are reflexes of phonological, morphological, and syntactic structure. I should also mention that in addition to H tones, the morphological structure also plays a role in assigning domains for the phonological representations. Evidence for the projection of domains on the basis of morphology is found in 'Cole 1992'.

The outline of this paper is as follows. First, I briefly describe in section 2 some morphological, phonological and tonal phenomena which are relevant to the assignment of domains and the application of phonological processes. In section 3 I present some data from Xhosa and briefly outline the problems of tonal

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analysis. In section 4 I discuss the assignment of domain structures and the application of phonological processes within domains. Finally, in section 5 I summarize the main points of my analysis.

2. Morphological, phonological and tonal structure.

The morphological structure of Xhosa nominals is not simple. It is particularly made complex by the 'irregular' behavior of the noun class prefix. As shown in 1, a Xhosa noun is composed of the noun class prefix and the stem. The prefix has an initial vowel which is referred to as the preprefix in the literature (Pahl 1976). The preprefix is a copy of the prefix vowel.

(1) Class 3 *ilí-zwe* 'country' Class 6 *amá-zwe* 'countries'
Class 7 *isí-zwe* 'nation' Class 8 *izí-zwe* 'nations'

In classes 1 and 3 the vowel of the proto-Bantu prefix **mu-* is lost and the nasal consonant is syllabic (2).

(2) Class 1 *um´-ntu* 'person' Class 2 *abá-ntu* 'people'
Class 3 *úm-thí* 'tree' Class 4 *ími-thí* 'trees'

Similarly, the vowel of the proto-Bantu class 9 prefix **ni-* is lost, but unlike classes 1 and 3 the remaining nasal is not syllabified. Instead it is pronounced homorganically with the consonant of the following stem syllable (3).

(3) Class 9 *ín-taba* 'mountain'
ín-komó 'cow'

In classes 5 and 11 the whole prefix deletes if the stem has two or more syllables (4).

(4) Class 5 *ilí-zwe* 'country' but *í-háshe* 'horse'
Class 11 *úlu-thí* 'stick' but *ú-dongá* 'wall'

Finally, in class 5 the prefix is optionally dropped out if the stem is monosyllabic (5).

(5) Class 5 *ilí-zwe* or *í-zwe* 'country'
íli-zwí or *î-zwí* 'voice

In general nominal stems do not have more than three syllables. Nevertheless longer stems are attained by extensions such as the dimunitive suffix *-ana*, augmentative suffix *-kazi*, feminine suffix *-kazi*, and locative suffix *-eni* (6).

(6) *amá-Xhosa* 'Xhosa' : *ama-Xhosákazi* 'Xhosa women'
amá-Xhosa 'Xhosaa' : *ema-Xhóseni* 'to the Xhosas'
ín-taba 'mountain' : *in-tátyana* 'small mountain'
ín-taba 'mountain' : *in-tabákazi* 'huge mountain'

The affixation of the suffixes involves some morpho-phonological processes which are not relevant to the issues discussed in this paper, hence I am not going

to discuss them here. Suffice to mention that these suffixes, together with the prefix in the case of the locative, do not contribute any tone to the noun.

Nouns (or all word categories) in phrase final position have a long penultimate vowel. The same phenomenon is exhibited by the other closely related languages such as Zulu and Swati. However, there is no vowel length contrast between words in these languages. It is thus assumed that the long penultimate vowel is not underlying, but is derived by a vowel lengthening rule (Clark 1988).

Xhosa nouns are divided into two tonal groups: L nouns and H nouns. This division is based on the claim that L nouns do not have an underlying H tone on any of their stem syllables, and that the H tone which surfaces in long forms is contributed by the preprefix. The diagnostic for L nouns and H nouns is the absence and presence of the H tone in the short nominal form. A short form is without the preprefix and it would appear in phrases like: 'Akúkho ... ' i.e. 'There is no ... ' (7).

(7) a. L nouns: *Akúkho* *zwe* 'country'
ba-ntu 'people'
ba-ntwana 'children'
si-bonjana 'small pole'
ma-Xhosakazi 'Xhosa women'
ma-dangatyekazi 'big flames'

b. H nouns: *Akúkho* *ma-zwí* 'voices'
ma-gwalá 'cowards'
ma-háshe 'horses'
ba-fâzi 'women'
m-hédeni 'heaten'
ma-Gcaléka 'people of Gcaleka clan'
m-nyhádalá 'game'
m-babalá 'old buck'
m-phongôlo 'cask'
bhóbh-óbyi 'African hoopoe'
m-dlámbîla 'rock cobra'

Notice that in (7a) both the prefix and the stem are toneless. When the preprefix is used all the forms given in (7a) surface with a H tone, e.g. *í-zwe, abá-ntu, abá-ntwana, isi-bónjana, ama-Xhosákazi, ama-dangatyékazi*. Thus, in the absence of evidence for the underlying existence of a H tone in these nouns it is construed that the H tone originates from the preprefix. The claim that the preprefix has an underlying H tone finds further support from monosyllabic and bisyllabic L nouns without the prefix. As shown in (8) the preprefix in these nouns is invariably H toned.

(8) *í-zwe* 'country'
í-gusha 'sheep'
ín-taba 'mountain'

The nouns given in (7b), on the other hand, represent a complex underlying tonal structure of the stem, namely H, OH, HO, HH, HOO, OHO, HOH, OOH,

OHH, and HHH. (letters H and O represent the presence and the absence of a H tone, respectively.) Although the patterns represented as underlying HH# surface with a falling tone on the penult, I will show in the subsequent discussion that some phonological processes apply to yield the falling tone on the penult and the deletion of the H tone on the final syllable. I will also show that in these forms the H tone is multiply linked to the tone bearing units which are moras. In the long form the nouns in (7b) surface with a H tone on the prefix or preprefix (9).

(9) *áma-zwí* 'voices
amá-gwalá 'cowards'
áma-háshe 'horses', etc.

From what we have seen in the long forms I claim that there is a constrained spread of the lexical H tone. The H tone spreads to the right and delinks from the left branches. The question now is: How can this spread rule be formalized? In *abá-ntu* 'people' the H tone spreads to the penult and in *am-Xhosákazi* it spreads to the antepenult. In *ama-háshe* 'horses' it does not spread while in *aná-gwalá* 'cowards' it spreads to the antepenult. I do not want to say that this spreading is arbitrary. Thus proposing a domain-based approach is an attempt to give a systematic account of the rule of H spread in Xhosa nominals. This approach will show that there is one H spread rule, and that the H tone spreads to the right edge of a domain (i.e. the rightmost mora in a domain).

Having described the pertinent morphological, phonological and tonal phenomena, I now turn to the tonal analysis and the problems associated with it.

3. Problems of tonal analysis.

In order to maintain the principle of H spread it is important to identify the target tone bearing units since the H tone does not spread all the way to the final syllable. One alternative is to posit two H spread rules. The first rule spreads the H tone to the penult if the stem is monosyllabic (10).

(10) H
| \
aba-ntu

The second rule spreads the H tone to the antepenult if the stem is longer (11).

(11) H
| \ \ \
ama-Xhosakazi

This proposal is falsified by examples such as *ím-babalá* 'old buck'. In *im-babalá* the H tone does not spread to the antepenult whereas it does in *amá-gwalá* 'cowards. Thus the facts shown by *ím-babalá* and *amá-gwalá* can lead to a conclusion that a H tone simply spreads to the prefix if the noun is H and to the antepenult if the noun is L. This proposal would also fail to account for the H spread to the penult in monosyllabic L nouns such as *abá-ntu* 'people'. Above all we notice that the tonal analysis of these data involves random counting of syllables. Note that there is no motivation for the H spread to the penult in some

nouns and the spread to the antepenult in others.

We notice that in both *ím-babalá* and *amá-gwalá* the H tone spread does not cross the prefix boundary. Taken at face value, the failure of spreading in *ím-babalá* could be easily ascribed to the 'irregular' nature of the prefix. However, the locative plural form has a 'regular' prefix yet the spread does not cross the prefix boundary (12).

(12) H H
| \ |
ezim-babaleni

This state of affairs counts as motivation for including the role of morphology in the assignment of domain structures.

4. Domain-structure assignment and application of rules.

Evidence from all nouns show that the final syllable is not a target for H spread. A second fact shown by L nouns with multi-syllabic stems is that the penult is not generally affected by the H tone spread rule. For convenience the examples which show these facts are repeated in (13).

(13) *abá-ntu* 'people'
abá-ntwana 'children'
isi-bónjana 'small people'
ama-Xhosákazi 'Xhosa women'

On the basis of these facts I postulate the construction of two domain structures, namely word domain (WD) and tone domain (TD). First, I assign a WD structure which excludes the final toneless syllable provided it is not the only syllable of the stem. This exception is intended to avoid constructing a word domain structure which does not have a stem syllable. Then I assign a TD structure which is triggered by the presence of a H tone.

To illustrate WD structure assignment I use the underlying forms of the L nouns given in (13). First, the rightmost syllable of the word projects a Right bracket to its Left if the stem is multi-syllabic, otherwise the rightmost syllable projects a Right bracket to its Right. Then the Bracket Matching Convention (BMC) places a matching Left bracket to the Left of the initial syllable of the word (14a).

(14a) *abá-ntu* (mono-syllabic)
H
|
[aba-ntu]

abá-ntwana (multi-syllabic)
H
|
[aba-ntwa] na

isi-bónjana (multi-syllabic)
H
|
[isi-bonja] na

ama-Xhosákazi (multi-syllabic)
H
|
[ama-Xhosaka] zi

The phonological representation contained in a WD is not relevant for the application of the tonal rule of H tone spread. A WD simply lays the foundation for the construction of a TD which also exludes a final toneless syllable. The exclusion of a toneless final syllable form the TD is equivalent to the Final Projection in Xitsonga (Kisseberth 1992).

A TD is constructed inside a WD in the following way. The rightmost syllable of a WD projects a Right bracket to its Left and the BMC provides a matching Left bracket to the Left of the initial syllable of a WD. Thus in (14b) the outer brackets mark WDs and the inner brackets mark TDs.

(14) H
|
[[aba-] ntu]

H
|
[[aba-] ntwa] na

H
|
[[isi-bo] nja] na

H
|
[[ama-Xhosa] ka] zi

The principles of domain-structure formation illustrated above apply generally to all nouns. The only different is that H nouns have multiple H tones. This situation necessitates the division of a TD into two or more smaller unlayered TDs. Thus the assignment of domain structures in H nouns is achieved by three steps. The first step assigns a WD structure. The second step assigns a TD structure, and finally the third step divides a TD into smaller TDs.

A WD structure in H nouns is obtained in the following way. The rightmost syllable of a noun projects a Right bracket to its Left if it is toneless, otherwise the rightmost syllable projects a Right bracket to its Right (16a). Then the BMC places a matching Left bracket to the left of the initial syllable.

(16a) *áma-zwí* 'voices' (H final syllable)

```
H          H
|          |
[ama   -   zwi]
```

```
áma-háshe   'horses'        (Toneless final syllable)
H           H
|           |
[ama   -   ha] she
```

```
úm-nyhádalá   'game'        (H final syllable)
H             H       H
|             |       |
[um   -   nyha  da  la]
```

```
úm-hédeni   'heathen'       (Toneless final syllable)
H           H
|           |
[um   -   hede] ni
```

Also, to obtain a TD from the WD structures given in (16a), the rightmost syllable of a WD projects a Right bracket to its Left if it is toneless. If it is H it projects a Right bracket to its Right. Then the BMC provides a matching Left bracket to the Left of the initial syllable (16b).

(16b)

```
  H          H
  |          |
[ [ama   -  zwi] ]
```

```
  H          H
  |          |
[ [ama   -  ha] ] she
```

```
  H          H  H
  |          |  |
[ [um   -  nyhadala] ]
```

```
  H          H
  |          |
[ [um   -  he] de] ni
```

Finally, a TD with more than one H tone is divided into smaller TDs. The number of these smaller TDs is proportional to the number of H tones associated with the syllables in the main TD. To obtain these structures each H toned syllable must project a Left bracket to its Left. Then the BMC provides a matching Right bracket (16c).

(16c)

```
  H          H
  |          |
[ [ [ama  -] [ zwi] ] ]
```

```
    H          H
    |          |
[ [ [ama  -]   [ ha] ] ] she

    H          H       H
    |          |       |
[ [ [um  -]   [ nyhada]   [ la] ] ]

    H          H
    |          |
[ [ [um  -]    [ he] ]  [de] ni
```

From the surface forms given in (16) we notice that the H tone does not spread to the right edge of a domain. I ascribe the failure of the H tone spread in these nouns to an OCP (a constraint that two H tones cannot be adjacent). Notice that the same OCP constraint is responsible for the failure of a H spread to the edge in *áma-gwalá* 'cowards' (17)

(17) *áma-gwalá* 'cowards'

```
    H          H
    | \        |
[ [ [ama-gwa]  [ la] ] ]
```

Another alternative would be the postulation of a Pre-H Projection in (17). A Pre-H Projection is postulated by Kisseberth to account for similar cases in Xitsonga. This rule causes toneless syllable in front of a H-toned syllable to project a Left bracket to its Left.

According to this proposal *amá-gwalá* would have a domain-structure given in (18).

(18) *amá-gwalá*

```
    H              H
    | \            |
[ [ [ama  - ] [gwa]  [ la] ] ]
```

In (18) the H tone does spread to the edge of a domain.

We also notice that in *ím-babalá* 'old buck' and *ez ím-babaléni* 'to the old bucks' the H tone of the preprefix does not only fail to spread to the edge of a domain, but does not go beyond the prefix (19).

(19) *ím-babalá* 'old bucks'

```
    H          H
    |          |
[ [ [im-baba] [la ] ] ]
```

ezím-babaléni 'to the old bucks'

```
    H          H
    |\         |
```

[[[ezim-baba] [le]]] ni

From what we see in (19) there is no reason why the H tone cannot spread to the first *-ba-*. On the basis of these facts I conclude that neither the OCP nor the Pre-H Projection is relevant to (19). I argue that in these nouns the H spread is blocked by a domain boundary which is projected by the stem. Specifically, the Left edge of a H stem projects a Left bracket to its Left (20). I must also mention that the stem is not always a relevant domain for the application of the H spread rule. It only blocks the H tone of the preprefix from crossing the stem boundary if there is a H tone on the stem.

(20)
```
H          H
|          |
[ [ [im -] [baba] [la] ] ]

   H       H
   |\      |
[ [ [ezim-] [baba] [le] ] ] ni
```

Given a domain structure the easiest way of accounting for the H tone spread is to say that the H tone spreads to the right edge of a domain. According to Hyman (1990) processes which are restricted to the initial or final position of a domain are called domain-limit rules. Following Archangeli and Pulleyblank's (1992) framework, Hyman proposes the following parameters for the domain-limit rules (21).

(21)

a.	domain	: PW, CG, PP, IP, U
b.	edge	: left, right
c.	function	: insert, delete, spread, delink
d.	trigger	: H, L, etc.
e.	target, conditions	: specific tone(s) and or tone-bearing units (TBUs)

For our purpose in this paper the parameters are as follows (22).

(22)

a.	domain	: TD
b.	edge	: right
c.	function	: spread
d.	trigger	: H
e.	target conditions	: toneless mora

Subsequent to the H spread there is a Left Branch Delinking rule which delinks the left branches after spreading. These rules interact with other phonological processes such as the lengthening of the penultimate vowel. Finally all toneless vowels are assigned a L tone by default. All these rules interact in the manner represented in (23) to yield the surface forms.

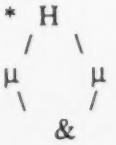
(23)

abá-ntwana	'children,		*abá-ntu*	'people'
H				H
|				|
aba-ntwana		U.R.		aba-ntu

H | [[aba-] ntwa] na	D-Structure	H | [[aba-] ntu]
H | [[aba-] ntwaa] na	Lengthening	H | [[abaa-] ntu]
H | \\ [[aba-] ntwaa] na	Spreading	H | \\\ [[abaa-] ntu]
H | \\ [[aba-] ntwaa] na [[àbá-] ntwàà] nà [abántwaana]	Delinking Low Default S.R.	H | \\\ [[abaa-] ntu] [[àbáá-] ntù] [abáántu]

As observed in *abá-ntu* (23) the Left branch Delinking rule does not apply to long vowels. It is blocked by a constraint given in (24).

(24)



This constraint finds support from the fact that a rising tone does not exist in Xhosa. Thus delinking in long vowels would yield incorrect surface forms such as * [abàántu].

The goal of domains is to put barriers or boundaries for the application of the H spread rule. This perhaps constitutes a universal rule for the theory of domains, namely that H tone spreading does not cross a domain boundary. Accordingly, in the representation given in (23) the H spread rule applies only within the tone domain. Anything outside this domain is invisible to this rule. More evidence for no-crossing of domain boundary comes from H nouns where there is a sequence of tone domains. The domain structure in *ím-babalá*, repeated in (25) confirms this point.

(25)
```
   H       H
   |       |
[ [ [im-] [baba] [la] ] ]
```

In (25) the stem domain boundary prevents the application of the H tone spread, hence there is no difference between the underlying and the surface tonal patterns.

Domains do not interfere with OCP. The first OCP effect is the H tone polarity exhibited by H nouns such as *ízi-kólo* 'schools', *áma-háshe* 'horses', etc.

These nouns have a sequence of tone domains, and the surface structure is derived in the manner shown in (26).

(26) *ízi-kólo* 'schools'

	H H | | U.R. izi-kolo
	H H | | D-Structure [[[izi-] [ko]]] lo
	H H | | Lengthening [[[izi-] [koo]]] lo
	H H | | \\ Spreading [[[izi-] [koo]]] lo
Low Default	[[[ízì-] [kóó]]] lò
S.R.	[ízi-kóólo]

In accordance with the formulation of the H spread rule we would expect the H tone linked to the preprefix in (26) to spread to the edge of the tone domain. The fact that this does not happen shows that the H spread rule respects the OCP. However, in the second tone domain the H tone does spread to the second mora. This is made possible by the fact that the final syllable is toneless.

Also, the same fact is shown by monosyllabic H nouns such as *î-zwí* 'voice' (27).

(27)

	H H | | U.R. i - zwi
	H H | | D-Structure [[[i -] [zwi]]]
	H H | | Lengthening [[[i i-] [zwi]]]
Spreading	N/A
Low Default	[[[í ì -] [zwí]]]
S.R.	[í ì-] [zwí]

Upon lengthening the penultimate vowel, the preprefix H in (27) is expected to spread to the second mora to yield * [*íí-zwí*] which is an incorrect surface form. Thus the correct surface form [*îí-zwí*] derives from the failure of the H tone to spread to the second mora despite the fact that the following adjacent H tone is in a separate domain.

In Xhosa the depressor consonants (mainly voiced consonants) play an important role in shaping the tonal structure of words. For example, the plural form of the L noun *si-londa, isí-londa* 'wound' (short and long form) is *zi-londa, izi-lônda* 'wounds'. The surface form *isí-londa* is derived by the application of the H spread rule in the manner discussed above. However, the plural form of the same noun surfaces with a falling tone on the penult.

Tonologists generally attribute this situation to the effect of the depressor consonant on the H tone (Clark 1988), (Khumalo 1989), etc. They argue that the depressor consonant shifts the H tone to the following syllable provided the following syllable does not have a depressor consonant. This process is called the depressor shift. Thus, according to this proposal *izi-lônda* is derived in the following manner (28).

(28) *izi-londa* 'wounds'

	H | izi-londa
U.R.	
	H | [[izi -] lo] nda
D-Structure	
	H | [[izi -] loo] nda
Lengthening	
	H |\ [[izi -] loo] nda
Spreading	
	H |\ [[izi -] loo] nda
Delinking	
	H | \ [[izi -] loo] nda
Depressor Shift	
Low Default	[[ìzì-] lóò] ndà
S.R.	[izi - lóònda]

In (28) we observe that the Depressor Shift rule, unlike H tone spreading, is

not blocked by a tone domain boundary. It is a special kind of local shift which applies in the word domain. Note that the Depressor Shift is not a domain-limit rule. Thus in (28) the shifted H tone does not affect the rightmost mora in the WD.

Lastly, I argue that H nouns such as *ín-kôsi* 'chief' (bi-syllabic) and *ú-bhóbhóyi* 'African hoopoe' (tri-syllabic) have a multiply linked underlying H tone on the stem (29).

(29) a. *ín-kôsi* 'chief'

```
H     H
|     /\
in - kosi
```

b. *ú-bhóbhóyi* 'African hoopoe'

```
H     H
|     / \
u - bhobhoyi
```

As seen in *ín-kôsi* the H tone does not surface on the last syllable. Nonetheless I argue that the underlying tonal pattern proposed in (19) exists, and that during the derivation process this pattern gets modified by some phonological processes.

At phrase medial position *ín-kôsi* surfaces with a H tone on the last syllable (30).

(30) *n-kosí yám* 'my chief/my God'

Compare (30) with (31). In (31) the noun *í-háshe* 'horse' has no underlying H tone on the first syllable, hence it has no H tone on the final syllable at phrase medial position.

(31) *háshe lám* 'my horse'

Because of its surface tonal structure at phrase medial position, I argue that *ín-kôsi* has an underlying H tone that is multiply linked to both syllables of the stem and that at phrase medial position the H tone is delinked from the penult by the general rule of Left Branch Delinking. The delinking of the left branch at phrase medial position would be made possible by the fact that in this position the penultimate vowel does not lengthen. I therefore assume that in isolation the lengthening of the penultimate vowel induces the fission of the multiply linked H tone. This then yields a situation which can account for the presence of the falling tone on the penult (32).

(32) U.R.

```
H  H
|  /\
in-kosi
```

D-Structure

```
H     H
```

```
                    |      /\
                [ [ [in- ] [kosi] ] ]
```

Lengthening

```
                    H       H
                    |      /   \
                [ [ [in- ] [koo ]  [si] ] ]
```

H Fission

```
                    H      H  H
                    |      |  |
                [ [ [in- ] [koosi] ] ]
```

Spreading N/A

In (32) we can see that after H Fission the H tone linked to the penult cannot spread to the second mora since there is a H tone on the final syllable. Now the only problem for the analysis proposed in (32) is the presence of the H tone on the final syllable. To resolve this problem I propose a rule which deletes the final H if there is an adjacent H (33). I call this rule Final H Deletion.

(33) Final H Deletion

```
                    H       H       H------> Ø
                    |       |       |
                [ [ [in- ]  [koo ]  [si] ] ]
```

Low Default [[[ín-] [kóò] [sì]]]

S.R. [ín-kóòsi]

The Final H Deletion is ordered after the H tone spread, otherwise the H tone spread will apply and yield incorrect results (34).

(34) Final H Deletion

```
                    H       H       H ------> Ø
                    |       |       |
                [ [ [in- ] [koo ]  [si] ] ]
```

Spreading

```
                    H       H
                    |       |\
                [ [ [in- ] [koo ]  [si] ] ]
```

Low Default [[[ín-] [kóó] [sì]]]

S.R. * [ín-kóósi]

When taking into account the tonal structure of nouns such as *izi-thûlú*, 'deafs' where there is a H tone on the penult and a H tone on the final syllable, it would seem as if the rule of Final H Deletion lacks independent motivation. However, underlyingly the stem of *izi-thûlú*, has a H tone only on the final syllable as seen in *'Akú kho zi-thulú*, i.e. 'There are no deafs'. Thus the falling tone on the penult is the product of the Depressor Shift discussed above. It has the derivation given in (35).

(35)

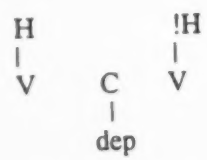
```
                    H   H
```

U.R.	izi-thulu
D-Structure	[[[izi-] [thu] [lu]]]
Lengthening	[[[izi-] [thuu] [lu]]]
Spreading	[[[izi-] [thuu] [lu]]]
Delinking	[[[izi-] [thuu] [lu]]]
Final H Deletion	N/A
Depressor Shift	[[[izi-] [thuu] [lu]]]
Low Default	[[[ìzì-] [thúù] [lú]]]
S.R.	[ìzì-thúùlú]

From the derivation in (35) we notice that the application of the depressor shift rule shifts the H tone onto the penult, thus yielding a situation which would necessitate the application of the Final H Deletion. However, the Final H Deletion is ordered before Depressor Shift and thus does not apply to the output of that rule.

It is a generally assumed that depressor consonants have a L tone associated with them (Khumalo 1989). This assumption stems from the fact that when H tones are separated by a depressor consonant the second H tone will be downstepped (36).

(36)



The downstep shown in (36) is attributed to the presence of the L tone on the depressor consonant. This phenomenon is noticed in *ú-bhóbhóyi*. I therefore assume that in *ú-bhóbhóyi* the depressor consonant *-bh-*, like vowel lengthening, induces fission of a multiply linked H tone, thus yielding the structure given in (37).

```
          H     H     H
          |     |     |
(37)  [ [ [u -] [ bho] [ bho] ] ] yi
```

It is important to note that although the pattern HHO# is shown to be attested, it is limited to nouns that have a depressor consonant on the penult. I thus argue that the patterns OHO# and HHO# get neutralized by the Left Branch Delinking rule which leaves one pattern: OHO#. (See the neutralization schema in 38)). The neutralization process explains why the pattern HHO# surfaces only in nouns with a depressor consonant on the penult.

```
            H                          H
           / \                        / \
(38)      CV  CV  CV# ---------> CV  CV  CV#
```

but

```
            H                          H  H
           / \                        |  |
(38)      CV  CV  CV# ---------> CV  CV  CV#
              |                          |
             dep                        dep
```

4. Conclusion.

I have shown that the tone domain is triggered by a H tone. This is the reason why L nouns do not have a sequence of tone domains despite the fact that they have the same morphological structure with H nouns.

The domains provide a solution to the problems that cannot be resolved by tonal analysis. For example, the tonal analysis does not show why certain syllables are targets for the H spread rule while others are not. Secondly, the spreading of a H tone cannot be explained adequately without postulating two rules of H spread. The domain-based approach, on the other hand, has shown that there is one H spread rule and that it spreads the H tone to the right edge of a tone domain.

I have shown that the H spread rule interacts with other rules to derive the surface tonal structure. In most cases the interaction of these processes involves the ordering of rules. The crucial rules that need to be ordered are: Vowel Lengthening before H Spreading, F H Deletion before Depressor Shift, and H Spread before F H Deletion.

Finally, I have shown that the complex tonal structure of Xhosa nouns can be explained by employing the theory of domains. The success of the rules in deriving correct surface forms while observing general principles such as the OCP gives them a valid status in the theory of phonology. In this way Xhosa renders support to the developing theory of domains.

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